

DIVISION OF ENVIRONMENT  
QUALITY MANAGEMENT PLAN

PART III:

BUREAU OF WATER  
WATERSHED PLANNING SECTION  
QUALITY ASSURANCE MANAGEMENT PLAN

Revision 2  
January 12, 2006

Kansas Department of Health and Environment  
Division of Environment  
Bureau of Water/Watershed Planning Section  
1000 SW Jackson St.. Ste 420  
Topeka, Kansas 66612

## **Approvals**

### **Approvals: Watershed Planning Section**

Title:           Quality Assurance Representative, Watershed Planning Section

Signature\_\_\_\_\_ Date\_\_\_\_\_

Title:           Section Chief, Watershed Planning Section

Signature\_\_\_\_\_ Date\_\_\_\_\_

### **Approvals: Division of Environment**

Title:           Divisional Quality Assurance Officer

Signature\_\_\_\_\_ Date\_\_\_\_\_

Title:           Director, Division of Environment

Signature\_\_\_\_\_ Date\_\_\_\_\_

## TABLE OF CONTENTS

<u>Section</u>	<u>Revision No.</u>	<u>Date</u>
1 INTRODUCTION		
1.1 Purpose of Document.....	0	01/12/06
1.2 Document History .....	0	01/12/06
1.3 Historical Overview of Section.....	0	01/12/06
1.4 Section Responsibilities .....	0	01/12/06
1.5 Current Quality Assurance Goal .....	0	01/12/06
2 QUALITY ASSURANCE POLICIES		
2.1 Quality Assurance Policies .....	0	01/12/06
3 QUALITY ASSURANCE ORGANIZATION		
3.1 General Section Activities .....	1	01/12/06
3.2 Staff and Supervisor Responsibilities .....	1	01/12/06
4 QUALITY SYSTEM DESCRIPTION		
4.1 Quality Assurance Management Plan .....	0	01/12/06
4.1.1 Quality Assurance Program/Project Plans .....	1	01/12/06
4.1.2 Standard Operating Procedures .....	1	01/12/06
4.2 Management System Reviews .....	0	01/12/06
4.3 Program/Project Audits.....	0	01/12/06
4.4 Data Quality Assessments .....	0	01/12/06
4.5 Internal Program/Project Reviews .....	0	01/12/06
4.6 Staff/Supervisor Performance Evaluations .....	1	01/12/06
4.7 Annual Program/Project Evaluations.....	1	01/12/06
5 PERSONNEL QUALIFICATIONS AND TRAINING		
5.1 Personnel Qualifications .....	0	01/12/06
5.2 Continuing Educational Opportunities .....	0	01/12/06
5.3 Quality Assurance Training .....	2	01/12/06
5.4 Supervisory Expectations .....	0	01/12/06
5.5 New Employee Orientation.....	0	01/12/06
5.6 Annual Review Affidavit.....	0	01/12/06
5.7 Safety Considerations .....	0	01/12/06

<u>Section</u>	<u>Revision No.</u>	<u>Date</u>
6	PROCUREMENT OF GOODS AND SERVICES	
6.1	Procurement of Services .....	1 01/12/06
6.2	Procurement of Equipment and Supplies.....	0 01/12/06
7	COMPUTER TECHNOLOGY	
7.1	Computer Hardware and Software.....	0 01/12/06
7.2	Data Entry Requirements.....	0 01/12/06
7.3	Verification of Calculations.....	2 01/12/06
8	DOCUMENTS AND RECORDS.....	0 01/12/06
9	PLANNING AND IMPLEMENTATION OF WORK	
9.1	Planning Requirements .....	0 01/12/06
9.2	Implementation Requirements .....	1 01/12/06
10	ASSESSMENT AND RESPONSE	
10.1	Assessments .....	0 01/12/06
10.2	Corrective Actions .....	2 01/12/06
11	QUALITY IMPROVEMENT .....	0 01/12/06
11.1	Quality Management Plan Review .....	1 01/12/06
11.2	Quality Assurance Communication .....	1 01/12/06
APPENDIX A: KANSAS CONTINUING PLANNING PROCESS		
	TMDL PROCESS SECTION.....	2 01/12/06
APPENDIX B: KANSAS 2002 303(d) LISTING METHODOLOGY		
	METHODOLOGY NARRATIVE SECTION .....	0 01/12/06

## Section 1

### INTRODUCTION

#### 1.1 Purpose of Document

This document presents quality assurance (QA) goals, policies, organizational responsibilities, and evaluation and reporting requirements applicable to the contracted environmental monitoring programs and data analysis projects administered and utilized by the Watershed Planning Section (WPS), Bureau of Water (BOW), Division of Environment (DOE), Kansas Department of Health and Environment (KDHE).

#### 1.2 Document History

Part I of the quality management plan (QMP) established overarching divisional QA policies and expectations and provided a consistent framework for developing QA documentation at the bureau level and program/project level (Part II and Part III of QMP, respectively). Part I was revised in July 2000 to comply with new divisional policies and federal requirements. The present document was prepared under the auspices of the latest (July 2000) revision and represented one of six bureau/office level QA management plans comprising Part II of the QMP. Since the latest revision, the Office of Planning and Prevention (OPP) has been split and moved administratively. The TMDL/Planning portion of the office is now located within the Bureau of Water. The Pollution Prevention portion of OPP has moved to the Bureau of Environmental Field Services. The TMDL/Planning portion of the OPP has been renamed as the Watershed Planning Section, one of eight Sections in the Bureau. The QMP for the Office of Planning and Prevention has been revised to reflect this split and move and becomes Part III of the QMP for the Bureau of Water/Watershed Planning Section. The changes to the document are primarily cosmetic to update the language associated with the OPP's split and move. An additional appendix has been added (Appendix B) to update the Watershed Planning Section's 303(d) Listing Methodology.

#### 1.3 Historical Overview of Watershed Planning Section

On November 1, 1995, the Kansas Natural Resource Council and the Sierra Club filed a complaint against the EPA, compelling it to enforce Section 303(d) of the Clean Water Act by establishing Total Maximum Daily Loads (TMDLs) pursuant to Section 303(d) and to compel EPA to approve or disapprove Kansas's Continuing Planning Process (CPP) relative to Section 303(e) of the Clean Water Act. Kansas intervened in the litigation, since the state had lead responsibility for identifying and ranking in priority the waters requiring TMDLs and establishing such TMDLs. A settlement was reached and a consent decree approving the settlement was made on April 13, 1998. Under the terms of the court decree, a schedule of submittals was agreed upon regarding the Continuing Planning Process document and the TMDLs established for the water quality limited water bodies of the state. The OPP was established in July 1, 1998 to address the requirements of this court decree, specifically the establishment of the state's TMDLs within the agreed upon schedule.

#### 1.4 WPS Responsibilities

The WPS is responsible for TMDL development including the monitoring and assessment of

impairment conditions in order to direct future implementation activities. The WPS accomplishes this through the utilization of in-house environmental data collected under the purview of other bureaus in the DOE, such as the Bureau of Water (BOW) and the Bureau of Environmental Field Services (BEFS). The WPS contracts to the United States Geological Survey (USGS), the Kansas Geological Survey (KGS), and the Kansas Biological Survey (KBS) to assess or monitor real time water quality conditions, surface water flow conditions, sedimentation and eutrophication in impaired reservoirs, and salinity sources in salt-impaired streams. The WPS also has routine access to USGS hydrologic software and historic hydrologic data.

#### 1.5 Divisional Quality Assurance Goal

The foremost goal of this QA management plan is to ensure that all data used by WPS in TMDL development are a product of known and acceptable quality and support, in a scientifically defensible manner, the informational needs and planning functions of DOE and KDHE.

## Section 2

### QUALITY ASSURANCE POLICIES

#### 2.1 Quality Assurance Policies

Environmental monitoring programs contracted through the WPS and the analysis of data projects performed by WPS in the development of TMDLs shall conform to the general policies set forth in Part I, section 2.2, of the QMP. In summary, the referenced section imposes the following requirements:

- (1) The objectives of each environmental monitoring program or project shall be clearly delineated during the planning stages of the contract program or project and within the contract itself. These objectives shall be consistent with the mission, policies, and priorities of the division.
- (2) Tolerable levels of data uncertainty shall be identified during the planning stages of each monitoring program or project so that appropriate procedures and resources may be incorporated into the design of the contract program or project.
- (3) Quality assurance and QC measures shall be integrated into all contracted environmental monitoring programs or projects in the most cost-effective manner possible without hindering attainment of the stated QA objectives.
- (4) A quality assurance project (program) plan (QAPP), describing how the contracted activity will achieve the stated objectives and the required level of data reliability, shall be developed by the contractor of each environmental monitoring program or project analyst. This document shall be reviewed and approved, at a minimum, by the section chief and by the applicable section QA representative prior to initiation of the contracted data collection. The QAPP will be a required document under provisions of the contract.
- (5) Contracted sample collection, sample analysis, and data management activities may be subjected to periodic evaluation by supervisory personnel and outside auditors to identify and correct deficiencies and enhance the credibility of each environmental monitoring program or project.
- (6) Measures shall be instituted within each contracted environmental monitoring program or project to ensure that the quality of obtained environmental data is accurately and permanently documented.

Deviations from the above policies may be permitted in the event of unusual or unprecedented emergency situations which are beyond the scope of previously approved QAPPs and SOPs and require an immediate response based on the best professional judgement of the contractor or project analyst. All such deviations should be documented and described at the contract close-out or upon completion of the analysis project and will be reviewed at that time by the section chief and section QA representative. These deviations and findings will be added to the end-of-year program evaluations submitted through the section QA representative to the divisional QA officer (see Section4.7).



### Section 3

## QUALITY ASSURANCE ORGANIZATION

### 3.1 General Section Activities

The BOW/WPS maintains its office in Topeka. As it relates to this QMP, the WPS has responsibility for the state's Total Maximum Daily Load determinations and 303(d) Listing Assessments. WPS also provides public meetings for various issues.

An organizational chart illustrating the section's current administrative and QA hierarchy is presented below.

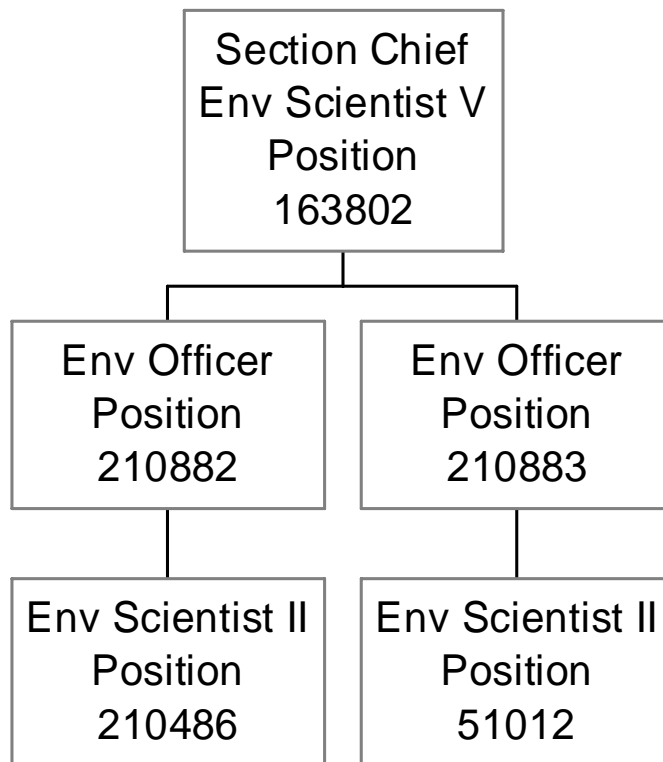


Figure 3-1

### 3.2 Staff and Supervisor Responsibilities

Staff expectations and responsibilities relative to QA and quality control (QC) are described in the following paragraphs.

**Section Chief** - This employee ultimately oversees the development, revision, and implementation of the section QA management plan (Part II of QMP) and associated QAPPs and SOPs from contracted environmental monitoring. With the assistance of the section QA representative and applicable staff, the section chief ensures that QA requirements are fulfilled in the most cost effective manner possible without hindering attainment of the stated QA objectives. The section chief prioritizes the training and continuing educational needs of staff and develops funding proposals to accommodate these needs, as necessary.

**Section QA Representative** - This employee is directly responsible for reviewing and approving QAPPs and SOPs developed through monitoring contractors. If necessary, this employee provides guidance to contracted program/project managers involved in the preparation and implementation of QAPPs and SOPs and operates under a degree of autonomy which allows the employee to make independent assessments of QA performance and the need for corrective action. As needed, the section QA representative analyzes QA evaluation reports and related information submitted by contracted program/project managers.

**Section Staff** - Individuals directly involved in the analysis of environmental monitoring data sets as they relate to TMDLs play an important role in the implementation of the QMP. Section staff often develop a keen understanding of the technical strengths and weaknesses of the section's data collection and analysis needs. These employees will also be involved and provide input in the review of QAPPs and SOPs developed by contractors.

## Section 4

### QUALITY SYSTEM DESCRIPTION

#### 4.1 Quality Assurance Management Plan

This document, the WPS QA management plan, establishes quality assurance (QA) goals, policies, organizational responsibilities, and evaluation and reporting requirements applicable to the contracted environmental monitoring programs and data analysis projects, administered and utilized by the WPS. Pursuant to Part I of the QMP (section 11), it must be reviewed at least annually and updated, if needed, by the WPS QA representative. Minor revisions to this plan are reviewed and approved by the section QA representative and section chief director. Major revisions, reflecting significant changes in the section quality management system, are reviewed and approved by the section QA representative, section chief, divisional QA officer, and division director. Changes constituting major revisions are identified by the WPS QA representative in consultation with the divisional QA officer. Deviations in the section QA management plan from the overarching divisional policies set forth in Part I of the QMP are approved only under exceptional circumstances and must be clearly explained and justified within the plan.

##### 4.1.1 Quality Assurance Program/Project Plans

A QAPP shall be developed for each contracted environmental monitoring program by the contractor and approved by the section chief and appropriate section QA representative prior to the initiation of data collection. Environmental data set analyses used in the development of TMDLs follow the guidelines in the Kansas's Continuing Planning Process (CPP) (dated December 1998) under the TMDL process section (included in this QMP, Part II, as Appendix A) which is adopted by this reference as the QAPP for these analyses. As the CPP is updated, it will be adopted by reference and added as a revision to this QAPP. The next anticipated revision is in 2006.

Each QAPP related to contracted environmental monitoring shall be prepared using a standardized document control format in which the report identity, revision number, date of revision, section number, and page number appear in the upper right-hand corner of each page. Each QAPP shall contain the following informational elements unless the reviewing section QA representative and/or section chief determines that a given element falls outside the technical scope of the program/project:

- (1) title page identifying program/project, section, bureau, division and agency;
- (2) approval page with blocks for appropriate signatures and dates;
- (3) table of contents, including a list of any appendices;
- (4) overview of program/project, including statement of purpose, developmental history, and any relevant statutory and regulatory requirements;

- (5) description (or chart) of organizational hierarchy with accompanying list of participating staff positions and statement of staff responsibilities as applicable;
- (6) description of data performance criteria expressed in terms of data precision, accuracy, completeness, comparability, and representativeness for each parameter of interest;
- (7) description of, and rationale for, intended sampling frequency, sampling network design, and monitoring site selection criteria;
- (8) description of sampling equipment and associated decontamination procedures (reference SOPs, as appropriate);
- (9) description of field procedures, including sample collection, analysis, preservation, transport and chain-of-custody procedures, and accompanying safety protocols (reference SOPs, as appropriate);
- (10) list of laboratory parameters and sample holding times and accompanying description of laboratory analytical and safety protocols (note: SOPs adopted by the Kansas Division of Laboratories or other cooperating laboratories may be adopted by reference, provided they contain the informational elements stipulated in section 4.1.2, below);
- (11) description of data validation, storage, transfer, reporting, and backup requirements and any special documentation requirements (reference SOPs, as appropriate);
- (12) description of equipment testing, calibration, and preventative maintenance procedures (reference SOPs, as appropriate);
- (13) description of inspection procedures and acceptance requirements for purchased equipment and supplies (reference SOPs, as appropriate);
- (14) description of procedures (including statistical procedures) used to evaluate data precision, accuracy, completeness, representativeness, and comparability, including a detailed characterization of internal QC procedures and external performance audit requirements;
- (15) description of procedures used to evaluate and enhance utility of environmental monitoring data, including, but not necessarily limited to, procedures and assumptions applied in the identification and treatment of (a) outliers and other anomalous data, (b) nonlinear data requiring statistical transformation, and (c) values reported as "less than" or "greater than" established reporting limits;
- (16) description of corrective action procedures for out-of-control situations;
- (17) description of procedures for determining the quality of ancillary data acquired from

external sources not subject to the provisions of the divisional QMP (e.g., meteorological, hydrological, geological, chemical and/or biological data obtained from other state or federal agencies); and

- (18) description of program/project deliverables (electronic databases, summary statistics, illustrative materials, interim and final reports, etc.) and schedule for completion.

Additional points to consider when preparing a QAPP are presented in the EPA documents *Guidance for Quality Assurance Project Plans* (EPA QA/G-5) and *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5).

#### 4.1.2 Standard Operating Procedures

Standard operating procedures document protocols used by contractors in the collection, preservation, transport, transfer, and analysis of environmental samples and in the collection, validation, storage, retrieval, transfer, backup, and analysis of environmental data. As such, they facilitate consistency among contracted staff, serve as valuable references and training tools, and provide formal written records of the methods used to implement environmental monitoring operations. All SOPs must be scientifically rigorous and compatible with the data performance criteria set forth in their respective QAPPs.

Environmental data set analysis procedures used in the development of TMDLs follow the guidelines in Kansas's Continuing Planning Process (CPP) (dated December 1998) under the TMDL process section (Appendix A) and is adopted by this reference as the procedures for these analyses. As the CPP is updated, it will be adopted by reference and added as a revision to these procedures. The next anticipated revision will be in 2006. The revision to the TMDL process will contain documented QA/QC procedures for retrieval and use of extramural data in the TMDL process.

Approved SOPs may be appended to the end of a QAPP or adopted by reference within the text of a QAPP. All SOPs related to the environmental monitoring contracts issued by WPS shall employ a standardized document control format in which the report identity, section number, revision number, date of revision, and page number appear in the upper right-hand corner of each page. Elements to consider when preparing an administrative, field, or laboratory SOP are presented in the EPA document *Guidance for the Preparation of Standard Operating Procedures (SOPs) for Quality-Related Documents* (EPA QA/G-6). Each technical SOP involving contracted field work and related sample and data collection activities shall contain the following informational elements, unless the reviewing section QA representative and/or section chief determines that a given element or combination of elements falls outside the technical scope of the environmental monitoring program/project:

- (1) title page with appropriate blocks for approval signatures/dates;
- (2) table of contents including a list of any appendices;
- (3) introductory statement describing intended application of SOP and providing overview of procedure;

- (4) statement of minimal technical qualifications for participating staff;
- (5) instructions for calibrating field instruments and performing associated troubleshooting procedures;
- (6) instructions for collecting, preserving, and handling environmental samples and/or performing environmental measurements, emphasizing health and safety considerations, and highlighting any steps requiring special attention, patience, or care;
- (7) instructions for collecting and analyzing duplicate or replicate samples and for preparing field blanks, spikes, and split samples, emphasizing health and safety considerations, and highlighting any steps requiring special attention, patience, or care;
- (8) instructions for preparing and analyzing samples in the field and performing related troubleshooting procedures, emphasizing health and safety considerations, steps requiring special attention, patience or care, and possible interferences jeopardizing data quality;
- (9) instructions for transporting, transferring, and storing environmental samples and accompanying field data and records (e.g., written notes and logs, conventional and digital photographs, audio and audiovisual tapes), emphasizing chain-of-custody procedures, health and safety considerations, and steps requiring special attention, patience or care;
- (10) description of data acquisition, storage, retrieval, transfer, verification, backup, and analysis procedures, long-term data/records management procedures, and enabling computer hardware and software;
- (11) glossary of technical terms and acronyms employed in SOP (often included as appendix); and
- (12) checklist of applicable field equipment and supplies (often included as appendix).

#### 4.2 Management System Reviews

As part of the DOE quality management system, set forth in section 4.2 of the QMP (Part I), management system reviews (MSR) may be conducted for WPS by the divisional QA officer. Auditors from EPA may perform MSRs for the entire division at the discretion of the EPA regional QA manager. The scheduling of an MSR will be determined by input from the section QA representative, the section chief, and the division director. Special timing considerations for MSRs shall be given to the WPS so that the court decree schedule of TMDL submittals is maintained. MSRs normally will follow the guidelines in the EPA document *Guidance for Preparing, Conducting and Reporting the Results of Management System Reviews* (EPA QA/G-3, draft 1993).

#### 4.3 Program/Project Audits

Pursuant to Part I, section 4.3 of the QMP, individual monitoring programs/projects and data analyses may be audited at any time by the divisional QA officer, section QA representative, federal oversight agency, or an independent third party contracted by the division or oversight agency. Special timing considerations for section program/project audits shall be given so that the court decree schedule of TMDL submittals is maintained. The section QA representative is expected to conduct data quality assessments for environmental contracted monitoring programs/projects and data analyses based on perceived need as set forth in the approved QAPPs. The QA performance of any given contracted monitoring program/project or data analysis project may also be assessed as part of an internal or external management system review (MSR) of the entire division. Staff shall cooperate with requests for information made in conjunction with these assessments, including but not limited to information on the adequacy of physical facilities, equipment, personnel, training, field and laboratory procedures, safety, record keeping, data validation and management, and other aspects of the specified monitoring program/project. If an assessment identifies the need for a corrective action regarding WPS data analysis projects, non-supervisory staff shall bear primary responsibility for reviewing the available options, selecting the most favorable, and obtaining the approval of both the section QA representative and the section chief prior to implementing the selected action. The implementation status of the corrective action shall be monitored by the section chief and addressed in the end-of-year program/project evaluation reports considered in section 4.7, below.

#### 4.4 Data Quality Assessments

Data Quality Assessments are performed during data analysis projects for TMDL development. If necessary, the results of these assessments will be provided to the bureaus or contractors collecting the environmental monitoring data used by WPS. WPS will work with the applicable bureaus and contractors, as needed, to develop corrective actions stemming from these assessments. The actions will be addressed in the end-of-year program/project evaluation reports (section 4.7).

#### 4.5 Internal Program/Project Reviews

Quality control aspects of contracted routine environmental monitoring operations and data analyses are subject to ongoing review/assessment by the section chief and section QA representative. The section chief and WPS staff are expected to cooperate fully with administrative requests for information on data precision and accuracy and overall QC performance. The section chief is expected to track the QC performance of WPS staff and assist these staff in identifying QC deficiencies within their respective projects, and facilitate necessary corrective actions. Results of any internal reviews as conducted by WPS shall be summarized in the annual program/project evaluation reports (section 4.7, below).

#### 4.6 Staff/Supervisor Performance Evaluations

Position descriptions and performance evaluations shall reflect the QA and QC functions and performances of staff. All staff involved in environmental data analysis are expected to carry out their responsibilities under the QMP to the best of their abilities. Administrative staff and the section chief are expected to foster an appreciation for the role of QA and QC among employees. In turn, the QA and QC opinions and insights of employees shall be carefully considered by section chief and administrative staff. The quality and credibility of the section's environmental data analysis efforts ultimately depend on the willingness of all employees to work as a team, learn from

their mistakes, and continually strive for improvement.

#### 4.7 Annual Program/Project Evaluations

As directed by the section chief, end-of-year program/project evaluations shall be conducted by section staff and the results submitted, in writing, through the appropriate section QA representative to the section chief and divisional QA officer by February 15 of the following year. These written evaluations shall indicate when, how, and by whom the evaluation was conducted and describe the specific aspects of the programs/projects subjected to review. They shall include a summary of important findings and recommendations for any necessary corrective actions. All section staff shall cooperate with administrative requests for QA and QC data during the preparation and review of the written program/project evaluations.



## Section 5

### PERSONNEL QUALIFICATIONS AND TRAINING

#### 5.1 Personnel Qualifications

Section staff involved in the storage, retrieval, transfer, and analysis of environmental data must possess the minimum level of education, training, and experience necessary to meet the demands of their position (as reflected in the class specifications for the job position or in the employee position description). The knowledge and skills possessed by staff and supervisory personnel strongly influence the interpretation of environmental data, and the appropriateness of most administrative and regulatory actions taken by the agency stemming from TMDL development/implementation.

#### 5.2 Continuing Educational Opportunities

Methods employed in the analysis or modeling of environmental data are subject to ongoing review and improvement. Occasional conceptual or technological breakthroughs may rapidly antiquate existing methods and require extensive training or retraining on the part of staff. Continuing educational courses offered by some agencies, software vendors, colleges or vocational educational institutions may fulfill these training needs. The section may reimburse employees for course work and related expenses provided the course subject matter is within the general scope of the employee position description, funds for training have been set aside within the budget of the beneficiary program/project, requests for reimbursement have been approved prior to attending training, and participation is otherwise allowable under prevailing agency training and travel policies.

#### 5.3 Quality Assurance Training

The section QA representative is responsible for working with all section staff to ensure that those staff implementing QAPPs and SOPs are familiar with their responsibilities under the QMP and have received an appropriate level of QA training. As time, training opportunities, and agency resources allow, the section chief and section QA representative are expected to complete the following (or equivalent) EPA training courses: *Orientation to Quality Assurance*, *Systematic Planning Process (Data Quality Objectives)*, *Quality Assurance Project Plans*, and *Standard Operating Procedures*. Additionally, as time allows, the section QA representative is expected to complete the following (or equivalent) EPA courses: *Quality Management Plans* and *Data Quality Assessments*. As resources and work priorities allow, other employees shall be encouraged to participate in QA training courses offered by EPA. Quality assurance training needs shall be addressed in the end-of-year program/project evaluation reports discussed in section 4.7, above.

#### 5.4 Supervisory Expectations

The quality of the section's environmental data analyses is strongly influenced by the level of staff training, experience, and preparation. The section chief is expected to address the general training needs of staff within the annual program/project evaluation reports. This information is incorporated annually into the WPS budget prepared by fiscal staff and the section chief. To broaden the experience of staff, the section chief may provide occasional opportunities for interested employees to participate in activities outside their daily work routines (i.e., cross training opportunities). Such

activities must be within the general scope of the employee classification specifications and conform to the training requirements presented in sections 5.5 and 5.7, below.

#### 5.5 New Employee Orientation

The section chief shall ensure that new personnel, including newly hired employees, recent transfers, or cross trainees from other programs/projects, receive a thorough indoctrination into the QA and QC policies and procedures of the division, bureau and the section. The present document, together with Part I of the QMP and all applicable QAPPs and SOPs of the QMP, shall be required reading on the part of all such employees. Apart from QA and QC considerations, supervisors shall ensure that all new personnel participate in orientation and training seminars required by the KDHE Office of Human Resources Management. Similarly, new supervisory employees are expected to successfully complete the introductory training course for supervisors offered by the Department of Administration. Safety procedures shall be thoroughly reviewed before any new employee engages in a potentially hazardous duty. New employees must demonstrate a satisfactory understanding of safety issues before they are permitted by their supervisors to participate independently in any potentially hazardous activity (section 5.7).

#### 5.6 Annual Review Affidavit

All section employees participating in environmental data analysis operations shall review the present document, in addition to Part I of the QMP and applicable QAPPs and SOPs of the QMP, at least once each year. Upon completion of this annual review, each employee shall sign an affidavit indicating he/she has read the appropriate QA documentation. The signed affidavit shall be routed through the section chief and section QA representative to the divisional QA officer. This review requirement shall be incorporated into the employee's written job expectations and factored by the section chief into the employee's annual performance evaluation.

#### 5.7 Safety Considerations

Section staff participating in any cross-training monitoring programs/projects encounter potentially hazardous situations on a frequent basis. In addition to the routine possibility of automobile, boating, or equipment accidents, employees may encounter slippery surfaces, toxic substances, fire or electrocution hazards, infectious microorganisms, vicious animals, belligerent persons, or other threatening situations. Injuries or illnesses resulting from such situations may lead to substantial human suffering. To minimize this risk, these cross-training staff must observe all safety requirements set forth in applicable QAPPs and SOPs of the supervising bureau's QMP and in the Interim Division of Environment Safety Policy and subsequent divisional safety policies.

## Section 6

### PROCUREMENT OF GOODS AND SERVICES

#### 6.1 Procurement of Services

Contractual services involving the acquisition or analysis of environmental data shall be planned and controlled to ensure that these services meet applicable technical and QA requirements. All contracts for services shall require a QAPP to be developed by the outside contractor and submitted to WPS (and any other participating bureaus) for review and approval prior to the initiation of data collection (section 4.2). Procurement of services shall comply with procedures described in the KDHE guidance notebook *Purchase Procedures and Payment Process*. Contracts shall reference or contain specific drawings, regulatory requirements, specifications, codes, standards, standard methods, procedures, and/or instructions that describe the services to be provided by the contractor. Contracts also shall specify minimal requirements for evaluating the suitability and acceptability of any data, reports, or other deliverables stemming from the contractual agreement. The section chief and the section QA representative (with the input, as determined by the section chief, from applicable staff) shall be directly responsible for ensuring that deliverables meet the requirements stipulated in the contracts.

#### 6.2 Procurement of Equipment and Supplies

WPS does not directly participate in environmental monitoring and, therefore, procures no equipment and supplies related to such activities.



## Section 7

### COMPUTER TECHNOLOGY

#### 7.1 Computer Hardware and Software

All purchases of computer hardware and software must be approved in advance by the KDHE Office of Information Systems (OIS) and abide by the purchasing requirements described in the KDHE guidance notebook *Purchase Procedures and Payment Process*. Anti-virus software approved by OIS shall be installed and utilized on all WPS lap-top and desktop computers and any agency minicomputers and mainframe systems used for storage, retrieval, transfer, backup, and/or analysis of environmental data.

#### 7.2 Data Entry Requirements

Environmental data (and metadata) manually entered into a state or federal computer database by any WPS employee shall be examined and verified by at least one other DOE employee familiar with the database. Staff transferring data electronically shall perform random spot checks of the transferred data and report any problems to OIS (or the external cooperating entity) for further investigation and resolution. Persistent or recurring problems shall be reported to the section chief and section QA representative for determination of necessary corrective actions. Such problems shall be addressed in the end-of-year program/project evaluation reports (section 4.7).

#### 7.3 Verification of Calculations

Computer-based mathematical, statistical, graphical, and geographical programs and models involving environmental data shall be tested before application and periodically thereafter. As needed, the reliability of software for performing calculations shall be tested by comparison to other computer programs, through hand calculations involving randomly selected data, or through other appropriate means. Calculations by separate staff for each computer-based analysis will be made to ensure random checks in computer calculations and program applications. The reliability of computer-based calculations shall be verified according to schedules established in applicable QAPPs and whenever a problem is reported within the computational system. Quality assurance program/project plans shall describe the types of computer-based calculations to be performed and prescribe measures for monitoring the precision and accuracy of these calculations. This requirement may be waived by the section chief for specific applications involving commercial software (e.g. Microsoft Excel, Corel Quattro Pro, ESRI ArcView GIS, MiniTab, SAS JMP) after review by both the section chief and the section QA representative



## **Section 8**

### **DOCUMENTS AND RECORDS**

Changes in the general manner of contracted environmental data procurement, the quality of the data collected by the contractors, or the analytical methods of data analysis shall be documented for future reference. The section QA representative shall maintain a hard copy library of all current and historical QA management plans, QAPPs, and SOPs administered by WPS.

An electronic representation of the section QA management plan and associated QAPPs and SOPs shall be maintained on the KDHE internet server in a PDF "read only" format and made accessible to any interested employee or outside party. The section QA representative is authorized and required to update this representation. In general, updates shall be made within 96 hours of approval of the hard copy revision. Only changes which have been formally approved pursuant to section 4.1 of this document shall be made to the master hard copy and electronic versions of the section QA management plan and associated QAPPs and SOPs.

All environmental monitoring data, obtained from contracted sources or other bureaus, and any WPS analysis of these data are kept for each TMDL as a matter of public record and are available from WPS upon request





## **Section 9**

### **PLANNING AND IMPLEMENTATION OF WORK**

#### **9.1     Planning Requirements**

All section operations involving the generation or analysis of environmental monitoring data must be systematically planned and documented. The primary planning documents utilized by WPS include work plans associated with the TMDL court agreement (section 1.3), the Kansas CPP, TMDL assessments and reviews, the annual divisional budget, and the QMP. End-of-year program/project reports and the division's annual QA report also serve in a planning capacity by addressing staff training needs, pending corrective actions, and upcoming QA initiatives and assessments.

#### **9.2     Implementation Requirements**

Environmental data analyses and contracted monitoring activities shall be implemented by qualified personnel based on approved QAPPs and SOPs. In the event of unforeseen contingencies, any deviation from approved procedures shall be documented and reported by the applicable section staff or contractor to the section chief and the section QA representative. The significance of the deviation and any needed adjustments or corrective actions shall be determined by the section chief and section QA representative with input, as necessary, from the staff actually performing the analyses.



## Section 10

### ASSESSMENT AND RESPONSE

#### 10.1 Assessments

Assessments are intended to increase the user's understanding of the system being examined and to provide an objective basis for improving the system. Pursuant to section 4, above, contractual environmental monitoring operations and data analyses covered by this QMP may be subject to internal and external assessments including, but not necessarily limited to, management system reviews, audits, performance evaluations, and data quality assessments. Primary assessment tools selected during the planning stages of a program/project shall be specified within the applicable QAPP and, at a minimum, subject to review and approval by the section chief and section QA representative. The results of routine assessments and any special assessments implemented at the discretion of administrative staff or other parties, and any corrective actions stemming from these assessments, shall be summarized in the end-of-year program/project evaluation reports discussed in section 4.7, above.

The section QA representative and, as directed by the section chief, other WPS employees called upon to assess the QA and QC performance of either a contract environmental monitoring program/project or a data analysis project must have a working familiarity with the technical and management operations performed within that program/project. They also must meet the minimum QA training requirements set forth in sections 5.1 and 5.3, above. These employees are granted the authority to...

- (1) access records, data, and other forms of documentation needed to evaluate the QA and QC performance of the program/project;
- (2) identify and document problems that diminish data quality;
- (3) suspend work operations upon detection of a serious adverse condition impacting quality or the safety of staff or the general public;
- (4) propose recommendations for resolving documented quality or safety problems; and
- (5) independently confirm the effectiveness of any implemented corrective actions.

The results of internal quality assessments must be set forth in writing and forwarded to the section QA representative, section chief, and divisional QA officer within the time frame stipulated in section 10.2, below.

#### 10.2 CorrectiveActions:

Within ten working days of the completion of an internal QA assessment, the WPS assessor shall

document, in writing, the need for any apparent corrective action and share this information, as applicable, with the section QA representative, section chief, and divisional QA officer. Within thirty working days of receipt of this notification, the WPS assessor, in consultation (as applicable) with the section chief and section QA representative, shall prepare a written response detailing his/her chosen course of corrective action and presenting a schedule for implementing this action. Copies of this response shall be forwarded to the section QA representative, section chief, and divisional QA officer. The section chief and section QA representative shall be responsible for reviewing, approving, and monitoring the implementation of the chosen corrective action. Corrective actions implemented during the preceding calendar year or scheduled for the upcoming calendar year shall be summarized for each program/project in the end-of-year program/project evaluation reports generated by the designated section staff (section 4.7).

Copies of program/project QA audit reports prepared by external assessment entities shall be distributed by recipient staff to the section QA representative, section chief, and divisional QA officer. Disputes concerning external audit findings and the need for corrective action shall be resolved at the lowest practicable organizational level. Disputes still unresolved after an interval of thirty working days may require intervention by the divisional QA officer and/or division director. Prior to intervention, the divisional QA officer or division director shall notify and consult with the section QA representative and the section chief. Upon resolution and/or acceptance of external audit findings, the section staff, in consultation with the section chief and section QA representative, shall prepare a written response within thirty working days detailing his/her chosen course of corrective action and providing a schedule for implementing this action. Copies of this response shall be forwarded to the section QA representative, section chief, and divisional QA officer. The section chief and section QA representative shall be responsible for reviewing, approving, and monitoring implementation of the chosen corrective action. Corrective actions implemented during the preceding calendar year or scheduled for the upcoming calendar year shall be summarized for each program/project in the end-of-year program/project evaluation reports generated by staff (section 4.7).

In accordance with Part I of the QMP, MSR reports submitted by external assessment entities shall be distributed by the divisional QA officer to the division director, the section chief, and the section QA representative. If a need for corrective action is indicated within an MSR report, a written response shall be prepared by the divisional QA officer within thirty working days and submitted to the division director for review and approval. The section QA representative and section chief shall be provided an opportunity to comment on the proposed response prior to its finalization and forwarding to the external assessment entity. The divisional QA officer shall monitor the implementation of each approved corrective action and summarize the status of each action in the DOE annual QA report.

## Section 11

### QUALITY IMPROVEMENT

Previous sections of this document have discussed specific mechanisms for bringing about the continual improvement of the section quality management system. These mechanisms include, but are not necessarily limited to, QA planning requirements (sections 4.1, 4.2, 9.1), internal and external quality assessments (sections 4, 10.1), employee training requirements (section 5), continuing educational opportunities (section 5.2), performance feedback requirements (section 4.6), corrective action procedures (sections 10.1, 10.2), and end-of-year program/project evaluations (sections 2.1, 3.2, 4, 5.3, 7.2, 10.1, 10.2). This section addresses two additional mechanisms for ensuring continual improvements in the quality management system:

- 1) the ongoing review and revision of the QMP itself; and
- 2) the regular communication of QA and QC concerns and recommendations among DOE staff.

#### 11.1 Quality Management Plan Review

At approximately yearly intervals, the section QA representatives shall review the section QA management plan, formulate any needed major revisions, and obtain the approval of the section chief, the divisional QA officer, and the division director. Similarly, section staff shall review those QAPPs and SOPs administered under their purview, formulate any needed revisions, and obtain the approval of the section chief and section QA representative.

Minor revisions to the section QA management plan do not require review and approval beyond the section QA representative and section chief. Questions regarding the appropriateness of an abbreviated review/approval process are resolved by the section QA representative in consultation with the divisional QA officer. Annual activities related to the review, revision, and approval of the section QA management plan and associated QAPPs and SOPs normally follow the completion and submission of the program/project evaluation reports in February. However, revisions to these documents may be implemented at any time based on urgency of need or staff workload considerations. All approved revisions are subject to the documentation, tracking, and record keeping requirements of section 8, above.

#### 11.2 Quality Assurance Communication

The section QA representative shall meet with the divisional QA officer, preferably on a quarterly basis, to review and discuss QA initiatives, training/resource needs, assessments, corrective actions, and other issues relevant to the divisional and section quality management systems. Any critical information exchanged during these meetings shall be communicated to the section chief by the section QA representative. The section chief is expected to meet with section staff as needed to obtain feedback on QA and QC issues and to relate this feedback to the section QA representatives.

In addition to the meetings considered above, those personnel involved in data analyses are encouraged to communicate openly and often on QA and QC issues and to express any concerns or recommendations to the section chief, section QA representative, and/or the divisional QA officer. An ongoing exchange of thoughts and opinions on these issues encourages the timely recognition of needed areas of improvement and is a hallmark of a healthy quality management system.

## **APPENDIX A**

### **KANSAS CONTINUING PLANNING PROCESS TMDL PROCESS SECTION**

(The following is from the Kansas Continuing Planning Process, TMDL Process Section, dated December, 1998.)

#### **TMDL Background**

##### **The 303(d) Process**

Section 303(d) of the Clean Water Act calls for each state to identify those waters within its boundaries for which effluent limitations are not stringent enough to implement any water quality standard applicable to such waters. The state also priority ranks those waters, accounting for the severity of the pollution and the uses to be made of the waters. For those identified waters, the state is to establish the total maximum daily load (TMDL) for those pollutants causing the non-attainment of the water quality standards. Such loads are to be established at a level necessary to implement the applicable water quality standard with seasonal variations and a margin of safety which accounts for uncertainty concerning the relationship between effluent limitations and water quality.

Federal Regulations provide additional guidance on the 303(d) process. Under 40 CFR § 130.7, the Continuing Planning Process describes:

1. The process for identifying water quality limited segments, requiring TMDLs.
2. The process for setting priorities for developing TMDLs, including Wasteload Allocations and Load Allocations.
3. The process for establishing TMDLs for those identified segments, including,
  - a. water quality monitoring
  - b. modeling
  - c. data analysis
  - d. calculation methods
  - e. the list of pollutants to be regulated.
4. The process of submitting the state's list and priority ranking and established TMDLs to EPA for approval.
5. The process of incorporating the approved loads into the state Water Quality Management Plans and NPDES permits.
6. The process to involve the public, affected dischargers, government agencies and local government in 303(d) activities.

TMDLs are required when technology based effluent limitations, additional federal, state or locally required effluent limitations and other pollution control requirements (best management practices) are not stringent enough to allow attainment of the applicable water quality standards. Water quality standards include numeric criteria, narrative criteria, designated uses of the water and antidegradation provisions.

Beginning in 1994, the list of water quality limited waters is submitted every two years to EPA and is due on April 1 of every even-numbered year. The list includes a priority ranking of those waters, specifically identifying those waters targeted for TMDL development in the next two years. The schedule of submission of the TMDLs is to be determined by EPA Regional Administrator and the state. The Regional Administrator shall approve or disapprove the list and the TMDLs no later than 30 days after submission to EPA. Upon approval, the state shall incorporate any approved loadings and allocations in its Water Quality Management Plan. If the Regional Administrator disapproves the listing or loadings, EPA will identify such waters and establish such loads necessary to achieve the applicable water quality standard within 30 days of the disapproval.

In order to develop the list of water quality impaired waters, the state is to assemble and evaluate all readily available water quality data and information, including:

- a. waters identified by the most recent § 305(b) water quality report as partially meeting or not meeting designated uses or as threatened.
- b. waters for which dilution calculation or predictive models indicate non-attainment of water quality standards.
- c. waters for which water quality problems have been identified by agencies, the public or academic institutions.
- d. waters identified as impaired or threatened in nonpoint assessments submitted to EPA under §319 of the Clean Water Act.

Supporting documentation is submitted with the list of water quality limited waters which describes the methodology to develop the list, the data and information used by the state, rationale for not using existing available data and demonstrated good cause for not including certain waters on the list. Good cause includes, more recent and accurate data, more sophisticated water quality modeling, flaws in the original analysis that led to erroneous listing of the water and changes in conditions.

TMDL development establishes levels necessary to attain and maintain water quality standards, allowing for seasonal variations and a margin of safety to safeguard the environment in the face of uncertain relationships between effluent limitations and water quality. TMDL determinations take into account critical conditions of streamflow, loading and water quality parameters. TMDLs may be established on a pollutant basis or using biomonitoring approaches. In either case, site specific information should be used if possible. TMDLs are established for all pollutants which prevent or are likely to prevent attainment of the water quality standards. All calculations to establish TMDLs are subject to public review.

TMDLs may also be required to regulate thermal loads which cannot be exceeded to assure protection and propagation of a balanced, indigenous population of shellfish, fish and wildlife. For the specific purpose of developing information and as resources allow, the state should also identify water bodies not water quality impaired and estimate TMDLs for probable pollutants. However, such listing and load estimation is not required to be submitted to EPA and priority will be given to TMDL determinations on those waterbodies identified as water quality limited.



## **The 1998 Court Decree and Resulting Schedule for TMDLs**

On November 1, 1995, the Kansas Natural Resource Council and the Sierra Club filed a complaint against the EPA, compelling it to enforce Section 303(d) of the Clean Water Act by establishing TMDLs pursuant to Section 303(d) and to compel EPA to approve or disapprove Kansas' Continuing Planning Process relative to Section 303(e) of the Clean Water Act. Kansas, intervened in the litigation, since the state had lead responsibility for identifying and ranking in priority the waters requiring TMDLs and establishing such TMDLs. A settlement was reached and a consent decree approving the settlement was made on April 13, 1998. Under the terms of the court decree, a schedule of submittals is agreed upon regarding the Continuing Planning Process document and the TMDLs established for the water quality limited water bodies of the state.

The court decree requires Kansas to update and submit to EPA a Continuing Planning Process consistent with Section 303(e) of the Clean Water Act by December 31, 1998. The Court Decree requires EPA to review the updated CPP within 90 days of receipt and provide Kansas and the plaintiffs with a summary of its review.

The court decree sets out a schedule for the state to submit TMDLs for water quality limited stream segments and lakes in each of the 12 major river basins in Kansas over an eight year period. The initial submittal will be for the water bodies of the Kansas-Lower Republican Basin, due June 30, 1999. Thereafter, TMDLs for two of the remaining eleven basins will be due for submittal on June 30, 2000. TMDLs for one of the remaining nine basins will be due on the following June 30 in 2001, then TMDLs from two of the remaining basins will be due in 2002. This 1-2-1-2 sequence will continue until all TMDLs from the 12 river basins are submitted to EPA by June 30, 2006.

Kansas will submit TMDLs only on those waters deemed to need such load determinations consistent with Section 303(d). This includes waters on the 1998 and 1996 Section 303(d) lists which are not removed from subsequent lists under the provisions of the Clean Water Act and the implementing federal regulations. It is anticipated that changes to water quality standards may remove and add segments to these lists. Should a water quality limited segment or pollutant removed from the 1996 list be restored to the list by EPA or Court order, Kansas shall establish the TMDLs for that segment or pollutant by the date set by the court decree schedule or two years after the court order, whichever is later. Should the state not establish the TMDL, EPA is obligated to do so consistent with the court decree.

TMDLs established by Kansas may be done on a watershed basis and may use a pollutant-by-pollutant approach or a biomonitoring approach or both as appropriate. TMDL establishment means a draft TMDL has been completed, there has been public notice and comment on the TMDL, there has been consideration of the public comment, any necessary revisions to the TMDL have been made and the TMDL has been submitted to EPA for approval. Should Kansas fail to comply with its obligations under the court decree, EPA must take appropriate action to establish the TMDLs in question within 180 days after the deadlines established in the court decree schedule.

Beginning January 31, 1999 and by January 31 of each year thereafter during the effective period

of the court decree, EPA and Kansas shall provide the plaintiffs with a written report, jointly if possible, regarding the activities undertaken to comply with the court decree during the previous calendar year. The report includes:

1. The water quality limited segments which had TMDLs established during the year;
2. The TMDLs established during the year; and
3. The water quality limited segments on the 1996 Section 303(d) list that are not on the current Section 303(d) list and an explanation why they are not on the current list.

The court decree also provides for the remedy and scope of judicial review, dispute resolution, modification procedures for the schedule, recognized exceptions in compliance with the court decree, demonstration of good cause and termination of the decree and dismissal of the plaintiff claims.

### **The Kansas 303(d) Process (SEE APPENDIX B)**

#### **Establishing Total Maximum Daily Loads**

Total Maximum Daily Loads (TMDLs) are viewed as the quantitative objectives and strategies needed to achieve water quality standards. The water quality standards, themselves, constitute the goals of water quality adequate to fully support designated uses of streams, lakes and wetlands. The process of developing TMDLs determines:

- the pollutants causing water quality impairments,
- the degree of deviation away from applicable water quality standards,
- the levels of pollution reduction or pollutant loading needed to attain achievement of water quality standards,
- corrective actions, including load allocations, to be implemented among point and non- point sources in the watershed affecting the water quality limited water body and,
- the monitoring and evaluation strategies needed to assess the impact of corrective actions in achieving TMDLs and water quality standards, including,
- provisions for future revision of TMDLs based on those evaluations.

In Kansas, TMDL development will follow the process described in the EPA's Guidance for Water Quality-Based Decisions: The TMDL Process as well as the seven TMDL components suggested in the recommendations of the Federal Advisory Committee on the TMDL Program in its final report, issued July 1998. The TMDL process involves:

1. Selection of the pollutant to consider, identifying the problem and defining the goal for improved water quality
2. Determination of the assimilative capacity of the water body to receive that pollutant without violation of the applicable water quality standard and the current deviations exceeding that assimilative capacity.

3. Estimation of the type, location and magnitude of pollutant sources contributing loads to the waterbody.
4. Estimation of the linked relationship between those pollutant sources and their relative impact on the ambient water quality of the water body, including the anticipated response in water quality conditions upon load modifications arising from the contributing sources.
5. Allocation of permissible loads among point, non-point and background sources of contributed pollutant reaching the waterbody. Assignment of responsibility for implementing corrective actions among point sources and non-point sources. Establishment of a margin of safety to safeguard the quality of the environment against uncertain relationships between pollutant contributions and ambient water quality.
6. Follow-up monitoring to assess the level of implementation along the water body and within the watershed and to evaluate the impact of that implementation on the water quality condition of the impaired waterbody.
7. A feedback mechanism which allows TMDLs and their implementation to iterate toward progressive improvement in water quality, as determined through compliance with water quality standards, over time and in response to evaluated information on the effective impact of corrective actions on water quality.

More specifically, each TMDL Kansas submits to EPA will contain the following components:

**A. Problem Identification.** The pollutant causing the impairment and the designated uses which are impaired will be identified. The rationale for listing the stream segment, watershed or lake on the Section 303(d) list will be described.

**B. Current Situation and Desired Objective.** The desired outcome of this TMDL process will be expressed, using the current situation as the reference condition of impairment. Deviations from the water quality standards will be documented. From the Kansas perspective, outcomes will be expressed in terms of the minimum frequency (how often), magnitude (how much) and duration (how long) of future deviations above the applicable water quality standard.

Because of the number of TMDLs to be done under the court decree schedule, a rapid method of discerning the current condition will be needed. In the case of TMDLs involving numeric criteria and empirical stream or lake chemistry monitoring data, Kansas will develop load duration analyses which will describe the idealized desired loadings across the spectrum of flow conditions. Such analyses will be developed using the long term flow historic duration of a stream and converting that cumulative frequency distribution of daily flows into loads by applying the appropriate numeric criteria to the flows and making the appropriate conversions.

The resulting curve relates the load distribution over time and flow conditions which would attain and maintain water quality standards. Empirical data from the stream chemistry monitoring network can overlay this curve by determining the flow conditions when the individual sample was taken, the sample data's relative position is determined by the percent exceedence of that flow over the long term, converting the sampled concentration by applying the flow and

conversion values. Points plotting above the curve represent deviations from the water quality standard and the permissible loading function, those plotting below the curve represent compliance with standards and represent adequate quality support for the appropriate designated use. Similar analysis can be done for certain lakes, using cumulative frequency distributions of their volume or elevation.

Comparative analysis such as this allows the state to assess the frequency of deviations (how many samples lie above the curve vs those that plot below); magnitude (how far the deviations plot away from the curve); and duration (potentially how long the deviation is present). The issue of duration can be viewed in terms of the flow conditions under which violations of the standards arise. In this analysis, loads which plot above the curve in the flow regime defined as being exceeded 85-99 percent of the time are likely indicative of point source influences on the water quality. Those plotting above the curve over the range of 10-70 percent exceedence likely reflect non-point contributions. Some combination of the two source categories lies in the transition zone of 70-85 percent exceedence. Those plotting above the curve at exceedences less than 10 percent or more than 99 percent reflect extreme hydrologic conditions of flood or drought.

This analysis allows a triage approach to identifying the likely significance of various sources along the waterbody or within the watershed and their contributions to the impaired condition seen within the water quality of the waterbody. Similar analysis is then conducted on a seasonal basis, using three seasons: winter low flow: November-March; spring runoff: April-June; and summer/fall baseflow: July-October. Each analysis serves to identify the critical time periods when water quality conditions deteriorate. Through this analysis, the circumstances and contributing factors of each deviation may be isolated and analyzed as part of the remaining components of the TMDL.

For impairments involving narrative criteria or biomonitoring data, surrogate indicators will be developed to define the TMDL objective. Such indicators include biotic index values, trophic state indices, number of acres covered by macrophytes, etc. Use of time trends in those surrogates will document the current conditions and will be used to define the quantitative outcome desired from establishing the TMDL and making progress toward reducing pollution and impairment in the identified waterbody.

For those waterbodies listed as a result of simulation model results indicating probable violation of water quality standards and impaired uses, the results of the modeling will be used along with sensitivity analysis to adequately define the conditions leading to impairment and the impact of intervening corrective actions toward improving those conditions. The Department will also investigate using the BASINS model to develop TMDLs and load allocations for a variety of segments and parameters across the state.

In all situations, the TMDL will state its objective in meeting the appropriate water quality standard by quantifying the degree of pollution reduction expected over time on a mass, volume or percent basis. Interim objectives or milestones will also be defined for midpoints in the implementation process. In some situations, such interim objectives will look for progress in moving the condition of an impaired waterbody from a condition of non-support to one of partial support en route to the ultimate objective of full support of that water's designated uses.

**C. Source Assessment.** Each pollutant source contributing to the deviation from the water quality

standards will be identified and their relative contribution to the impaired situation determined/ Based on the flow-load analysis, judgments can be made on the degree point and non-point sources are contributing to the current condition. The number of sources, their geographic location along the segment or within the watershed, the type of source, the magnitude of their potential pollutant loading and their degree of influence on water quality will be identified.

For point sources, the assessment will include the type of wastewater and treatment they use, the volume of their discharged effluent, degree of compliance with existing permits, the limits in place on current permits, the expiration date of those existing permits, their potential for future growth and the expected flow conditions which they are expected to protect. Situations where the point source impacts will accumulate in a watershed setting or in a downstream manner will also be described.

For non-point sources, information will be gathered on the land uses within the watershed, the underlying topographic and soil features, likely contributing areas producing runoff, percent of impervious area within the watershed producing stormwater discharges, stream-aquifer interactions, existing management practices in place and the limits of those practices to influence hydrologic extremes, and types of water use present along the streams and lakes, including diversions of that water.

This component will also present any documented information on the background levels of pollutants emanating from natural sources or sources lying outside the effective area under TMDL development. Levels of spatial or temporal uncertainty in the flow and water quality conditions of the impaired water body and its watershed will be expressed as part of the background assessment.

**D. Load Allocation.** In this context, allocation has the dual meaning of allocation actual allowable pollutant loadings among point and non-point sources as well as the more significant role of assigning appropriate responsibility of pollution reduction to sources and activities influencing the water quality of the impaired stream or lake. This component will lay the groundwork for implementation action to correct or improve the source impacts on water quality. A hierarchy of relative contributions among the sources will be established so that initial efforts will focus on those sources with greater influences. Considerations will be made of future alterations in those sources, seasonal variations and defined flow conditions. A margin of safety will be declared as part of the TMDL objective to provide safeguards to the waterbody from the uncertainty inherent in the impacts of point and non-point sources. The margin of safety will likely vary by pollutant.

**E. Implementation.** This component will describe the actions to be taken to control and manage point and non-point source contributions to pollutant loadings. Typically, a ten year period of implementation actions will be anticipated after TMDL approval. In the case of point sources (municipal, industrial and livestock), allocations of wasteloads will be made through renewed NPDES permits. The state will strive to place all NPDES permits along a segment, string of segments, within a watershed and eventually throughout each basin on the same schedule. For those point sources needing improvements, a compliance schedule will be developed. Use of the Kansas Water Pollution Control Revolving Loan Fund for upgrading wastewater facilities will continue to assign additional priority points to those scheduled projects discharging into a stream listed under Section 303(d) and subject to the conditions of a TMDL. Permits will reflect TMDL

objectives by placing water quality based limitations on effluent discharges. In some cases, individual permits will assign the individual allocation of a wastewater load to a discharger, reflecting the distribution of wasteload allocations among the group of point sources sharing a common waterbody.

The principal mechanism of implementation for non-point sources will be targeted technical assistance, educational outreach and financial resources directed toward placing best management practices in critical contributing areas of watersheds influencing the water quality of listed streams and lakes. The key strategy will be to reduce pollutant loadings from these areas to the maximum extent practicable. Most of these efforts will rely on voluntary, incentive based approaches, consistent with current practice of the *Kansas Water Plan* and federal programs, such as Environmental Quality Improvement Program (EQIP). Reasonable assurances can be made to implement this strategy with the use of the *Kansas Water Plan* and its supporting programs, its Annual Implementation Plan to set short term priorities for those programs, the \$16 million annually available from the State Water Plan Fund and the development of Unified Watershed Assessments (UWAs; described in the Water Quality Management Plan section) to funnel federal funds such as Section 319 grants and EQIP into priority subbasins and watersheds. TMDLs will supplement efforts to improve quality in the priority watersheds identified through the UWA process, by directing resources to priority locations within those watersheds.

The *Kansas Water Plan* supports water quality protection efforts through directing and funding a number of programs such as non-point source pollution technical assistance, non-point pollution control cost sharing, local environmental protection planning, water resource cost-share, wetland and riparian protection, subbasin water resource management, water quality buffer initiatives, biological monitoring, stream gaging, research evaluations and basin assessments. With the call by the Kansas Water Authority to significantly increase the percentage of stream miles and lake acres which fully support their designated uses by the year 2010, implementation of TMDLs, particularly related to non-point source activities, will work toward achieving that Water Plan goal as well as the goals of the surface water quality standards.

Three mechanisms exist within state authority to address pollution sources, particularly those of a non-point nature.

1. Critical Water Quality Management Areas. Watersheds may be designated as critical water quality management areas because of pollutant sources which cause or may reasonably be expected to cause, damage to resources of the state; public nuisance or health hazards; destruction of fishery habitat; excessive deposition of sediments on river bottoms, lakes or reservoirs; additional risk to threatened or endangered fish or wildlife or violation of water quality standards. The Department of Health and Environment evaluates all the pollutant sources and the extent by which they contribute to pollution problems within a proposed area and determines the technical and economic feasibility of simultaneous control of all pollutant sources. A proposed management plan is set forth with an implementation schedule for control of each source, an analysis of the costs and benefits of the plan and the boundaries of the proposed area. Considerable public input is solicited in the pre-designation phase, and the preparation of the management plan as well as formal public hearings on the proposed designation of the area.

2. Pesticide Management Area. The Kansas Department of Agriculture is empowered to develop pesticide management areas when notified by EPA or KDHE that a pesticide poses a serious

threat to the public health, safety and welfare or to the natural resources of the state. Such areas are developed upon examination of precipitation, topography, soils and depths to ground water and are designated as permitted, modified or prohibited in the use of certain types of pesticides. The Department uses a technical advisory committee in establishing the boundaries and management plan for the proposed area. Designation of the proposed area and its management plan is subject to public notice and comment through public hearings.

3. Source Water Protection Planning. Under the guise of the federal Safe Drinking Water Act, the Department of Health and Environment is to stimulate, provide assistance and coordinate the development of state and local source water assessments to protect public water supplies. Such assessment planning delineates local public water supplies, inventories pollutant sources, analyzes the susceptibility of the pollutant risks and informs the public on the present conditions, risks and risk reduction plans associated with their water supplies. The program is coordinated with the State Wellhead Protection Program assessing the protection of ground water supplies. In many situations, developed plans are implemented through actual protective measures in the source water contributing areas falling under local jurisdiction of zoning and ordinances to reduce pollutant threats.

**F. Follow-up Monitoring.** Follow-up monitoring will be conducted in order to further reduce the uncertainty in environmental impacts of pollutant source contributions and alteration encountered in establishing the objectives and implementation of TMDLs and to determine the effectiveness of implementing actions on improving water quality. Monitoring is conducted on numerous fronts. Implementation monitoring tracks the degree to which corrective or management practices have been put in place for point and non-point sources along the segment or within the watershed. Non-point measures might include acres of land treatment implemented over time, increases in riparian area adjacent to streams, number of agricultural producers participating in cost-share programs and participation in outreach education events focused upon non-point source reductions. Point source monitoring would include compliance monitoring relative to existing and future NPDES permits, episodes of combined sewer overflows, status of scheduled upgrades in treatment facilities, episodes of emergency bypass through treatment works, maintenance schedules and upkeep for treatment facilities and ongoing training for treatment works operators.

Resource monitoring assesses the improvement in water quality conditions in the identified impaired waterbody. Baselines need to be established documenting current conditions. Generally, water quality data taken over 1990-2005 will serve as the benchmark by which implementation of TMDLs will improve upon. Data will be examined in summarized form and as to trends over time. The ambient stream chemistry network will be generally maintained, with possible suggestions to expand spatial and temporal coverage in terms of additional sites and frequency of collection. Biomonitoring will continue to play a chief role in representing the integrated impacts of activities on water quality as registered by the supported biota of a stream or lake. The measure of success will be reductions in the frequency, magnitude and duration of violations of the water quality standards over the next decade.

Occasionally, synoptic surveys may be conducted to further evaluate loadings in a watershed setting above historic monitoring points, confirming load contributions from tributary areas within the watershed. Low flow intensive surveys will document impacts of effluent discharges on receiving waters. Stormwater monitoring may be recommended to further evaluate the contributions of urbanized areas on non-point loadings. Some follow up modeling may also be

conducted, using BASINS, QUAL-2K, EUTROMOD, etc, to verify previous results, leading to implementation decisions and to further discern locations and conditions needing treatment in order to achieve the TMDL objectives.

The purpose of these monitoring efforts is to continue to guide implementation actions toward those opportunities creating the greatest, timely benefits in improving water quality. Monitoring should look toward trends of improvement and the meeting of interim milestones established within the period of TMDL implementation. In all cases, follow up monitoring will incorporate appropriate quality assurance/quality control protocols to assure the reliability of the data used for verification, increased scrutiny and evaluation of management practices.

**G. Feedback Mechanism.** As stated previously, Kansas intends to use a decade of implementation and monitoring after TMDL establishment to maximize the opportunity of placing resources on pollutant sources at the basin scale. This timeframe also increases the likelihood to discern the signal of positive influence amidst the variable noise associated with flow and water quality data, particularly in non-point source situations. There will be interim objectives incorporated within the TMDL implementation schedule to assess the direction of corrective actions at the midpoint of implementation and make appropriate adjustments. All implementation actions are available for review and adjustment within the timeframe of trying to accomplish the objectives of the TMDLs. NPDES permits are renewed at least every five years. Best Management Practices are subject to availability of funding and administrative policies and will reflect revised directions provided by the *Kansas Water Plan* and its Annual Implementation Plan.

### **Public Participation Process**

Kansas intends to use the existing Water Planning Process to create opportunities for coordination with other agencies, interest groups and the general public.

Internally, the Department of Health and Environment will convene appropriate intra-agency work groups to address specific issues of TMDL establishment and implementation. Such work groups include staff from the Bureau of Water dealing in water quality standards, municipal permits, livestock permits and non-point source pollution and the Bureau of Environmental Field Services dealing with monitoring, biomonitoring, use attainability analysis, data analysis, geographic information and planning. The Planning and Prevention Section will interact with the other state agencies on TMDLs through the coordination functions of the Kansas Water Office, the Kansas Water Authority and the *Kansas Water Plan*.



Agency coordination is assured through monthly agency meetings, the Governor's Water Quality Coordinating Committee, the Kansas Water Authority's Quality Committee and staff-level interactions. The Quality Committee of the Kansas Water Authority receives briefings on water quality protection activities of the state, particularly those which implement the *Kansas Water Plan*. The Committee makes policy and budget recommendations influencing implementation activities centered on improving the water quality conditions of the state. The committee meets coincidentally with the quarterly meetings of the Kansas Water Authority in January, April, July and October and provide public forums. Basin Advisory Committees are present in each of the 12 major river basins, appointed by the Kansas Water Authority to advise the Authority on basin issues and concerns relative to the programs and policies of the *Kansas Water Plan*. The 11 members of the BAC reside in the basin and represent some aspect of water use in the basin; domestic, municipal, industrial, irrigation, fish, wildlife and recreation, as well as the interested public. The chief responsibility of the BAC is to advise the Kansas Water Office and the Kansas Water Authority on the issues of the basin, the desired direction of applicable state programs and guidance of such programs through the provisions of its Basin Plan. Such plans reflect the direction and priorities of the basin relative to issues of water supply, water quality, flooding, environmental protection, fish, wildlife and recreation, water conservation and data and research. These plans represent the basis for setting priorities through the Annual Implementation Process.

The State Water Planning Process is typically framed around the state fiscal year. Beginning in July, issues of policy and basin specific concern are investigated and analyzed, culminating in the possible release of a preliminary draft of a policy or basin subsection of the *Kansas Water Plan* in January. During the initial six months, background information is collected, preliminary ideas are discussed and evaluation of the issues is completed at the BAC and Water Authority levels. The preliminary drafts approved for release by the Authority in January summarize the issue and its background information and present initial options and recommendations for public consideration. Public meetings are held throughout the state in March, after which, public comments are incorporated and a working draft of the proposed subsection is prepared for Authority review at its April meeting. The Authority approves the working draft for release to the public for formal comment and testimony at public hearings in June. After those hearings, the comments are considered in redrafting the subsection into a final draft for presentation and approval to the Kansas Water Authority at its July meeting. Should the Authority approve the subsection in July, it becomes part of the *Kansas Water Plan*, applicable as state policy and authority for implementation, including using funds from the State Water Plan Fund.

Funding issues are handled through the Annual Implementation Plan which is framed around the budget preparation schedule of the state agencies. The process typically starts in January and February with the collection of information from the agencies on the status of achieving the previous and current year implementation objectives, current activities, raised issues and suggested direction for the next fiscal year. That information is presented to Basin Advisory Committees in the spring and the Authority issues the implementation plan at its July meeting in order for state agencies to incorporate the recommendations in their next fiscal year budget requests submitted on September 15. At the October meetings of the BAC and the Authority, the agency budgets are analyzed relative to the implementation plan and recommendations are made from the Authority to the Governor and Legislature regarding allocations of State Water Plan Funds to the various state agency programs.

With the impending work on TMDLs across the state, the Authority has authorized expenditures from the State Water Plan Fund for developing and implementing TMDLs. Plans also call for the incorporation of specific TMDLs and priorities for implementation within the basins into each of the specific Basin Plans of the *Kansas Water Plan* during the time period that TMDL work is underway within that basin. The proposed Basin Plan subsections will include background information, including the impaired water bodies in the basin and the associated pollutants; the linkage of TMDL development to the Water Quality Protection Strategy policy subsection of the *Kansas Water Plan*; priorities for TMDL implementation in that basin, identification of programs to be used in implementing TMDLs in the basin; and any data, monitoring and research needs in the basin associated with TMDLs.

By incorporating TMDLs into the Basin Plans, the Kansas TMDL process will use the public participation aspects of the State Water Planning Process. Briefings will be made to the Kansas Water Authority at its quarterly meetings. Monthly meetings with the BAC in the basin where TMDL work is being conducted is anticipated. The March public meeting in that basin will center on the question of TMDLs and their implications for basin activities. Likewise, the June public hearings will take testimony not only on the TMDL subsection of the Basin Plan, but on the TMDLs themselves. Additionally, basin specific TMDL public forums will be scheduled for April of each year at a couple of locations within the basin to facilitate a dialogue among the agencies, the general public, impacted dischargers, interest groups and municipalities on the TMDLs and their implementation.

Recognizing that tangent deliberations occur outside the State Water Planning Process, the Department is also scheduling regular meetings with the interest groups representing municipalities, agriculture and environmental concerns. Such organizations include the League of Kansas Municipalities, the Kansas Farm Bureau, the Kansas Natural Resources Council, etc. Basin specific interest groups will also be solicited for input and advice as the TMDLs specific to the water resources of their concern are developed. Additionally, specific task forces will be used for unique water resources or pollutants to help establish TMDLs for those situations. KDHE will develop, maintain and update a TMDL website on their agency Internet home page to provide the public with the status and new developments of TMDL activities on a statewide and basin specific basis.

The input received through these forums and the other outlets provided by the State Water Planning Process will be incorporated within the submittal of the TMDLs to EPA by June 30 of each year. Approximately two weeks after those TMDLs are submitted, the Department will also submit the approved Basin Plan TMDL subsection of the *Kansas Water Plan* approved by the Kansas Water Authority prior to July 15.

## Summary

Kansas views the establishment and implementation of TMDLs on a basin basis as a planning endeavor which will achieve both the water quality goals expressed by the surface water quality standards and the objectives of the *Kansas Water Plan* to significantly increase the percentage of stream miles and lake acres fully supporting their designated uses.

Kansas will heavily rely on its extensive coverage of flow and water quality data to derive appropriate TMDL objectives. The state will use its existing authorities and programs to

implement those TMDLs. Kansas will use its existing State Water Planning Process and associated interactions with interested parties to maximize the opportunity for public participation in establishing TMDLs in the state.



## **APPENDIX B**

(The following is a link to the current 303(d) methodology and list)

<http://www.kdheks.gov/tmdl/basic.htm#Kansas303>